

**ABSTRACT**

[109] Disclosed is a calcium-enriched organic fertilizer for acid soil and/or a magnesium-enriched organic fertilizer for field products and/or a silica-enriched organic fertilizer for paddy field products, and its manufacturing method, which method includes elimination saline matters harmful to the soil and plants/animals from organic waste including food waste, adding quick lime and/or dolomite for hydration, and introducing a drying exhaust gas having a high CO<sub>2</sub> content generated from the factory, an exhaust gas from a lime calcining kiln, or an out sourced CO<sub>2</sub> gas into heretically sealed mixer, aging tank and hydration tank in the reverse order to cause a carbonation reaction between CO<sub>2</sub> and the dissociated ions of the additives and thereby make the organic waste in a weak alkaline state, and adding a siliceous material.

Alternatively, a customized organic fertilizer suitable for the ingredients of a specific soil and a soil conditioner can be prepared by adding carbon resources, zeolite, bentonite, clay minerals, moisture regulator, or organic materials to those organic fertilizers. The present invention is also directed to a functional organic plant nutrient for high-value garden plants or lawn in golf links and its manufacturing method, which includes further adding a functionality provider prepared from chitosan to enhance the plants' absorption of nutriments and metal ions, reduce the calcium deficient of the plants caused by acid rain and increase the plants' resistance and strength. Furthermore, the present invention is directed to a method for sanitary treatment and enhancement of hydration in which the reactor tank, the aging tank and the mixer are hermetically sealed in the manufacture of the organic fertilizers to provide a condition of high temperature and high pressure like a

pressure cooker through internal exothermic reaction and volume expansion and thereby destroy disease-causing bacteria and insect eggs under strong alkalinity caused by the dissociation of lime contained in the additives; a method for eliminating the damages of products and olfactory offensiveness caused by harmful gas through chemical deodorization using a reaction between calcium ions and malodorous substances (e.g., nitrogen and sulfur compounds) and physical deodorization using a deodorizer; and a method for manufacturing a neutralizer for acidic waste as a byproduct by condensing the vapor and exhaust gas generated in the CO<sub>2</sub> gas introducing process.

**[110]** In conclusion, the present invention enables to utilize environmental contamination-causing organic waste including food waste as a weak alkaline fertilizer in an economical way and apply the organic fertilizer on a large scale as compost, thereby contributing to environmental improvement and organic farming and establishing a system for converting the organic waste into the products of the nature circulation.